

CHAPTER 2

SYSTEM STANDARDIZATION

2.1 GENERAL

The Naval Electronic Systems Command prepares and issues NAVELEX Standard Plans functional block diagrams for the processing and distribution facilities to be engineered for each type of shore station system. Use of these plans ensures uniformity of facilities and aids in standardizing operating procedures. The Defense Communications Agency (DCA) prescribes the Defense Communications Systems (DCS) HF radio circuits to standardize processing and distribution facilities for point-to-point communications within the DCS.

Naval Communication Stations provide tactical communications, interface with DCS facilities, and act as DCS relay terminals. A station meets these communications requirements by implementing circuits in accordance with the needs at a particular time. To maintain flexibility of communications capabilities, the installed systems and equipment are designed, where possible, to satisfy both the DCS and Navy requirements.

2.2 DCS HF RADIO CIRCUIT

The DCS HF radio circuits provide for long-haul, point-to-point composite transmissions that carry a large portion of today's high-volume traffic load. The basic publications that prescribe the DCS radio circuit requirements are: DCAC 330-175-1 - "DCS Engineering Installation Standards Manual" - DCAC 370-185-1 - "DCS Applications Engineering Manual", and MIL-STD 188-317 - "Standards for long haul communications." The basic circuit is shown by figure 2-1. This circuit is composed of one to four channels, each with a bandwidth of 3 kHz. The independent sideband (ISB) technique is used to transmit up to four of these channels within the authorized 12-kHz bandwidth. When ISB techniques are used, the sideband channel allocations are as shown in figure 2-2.

2.3 STANDARD PLANS

Standard plans are the detailed installation design drawings required to accomplish a shore communications equipment installation. See the "Guide for the Application of Standard Plans," (Hypothetical Communications Station). The Naval Electronics Systems Command is responsible for the preparation of the plans and publishes a quarterly standard plans index. These plans include technical data, notes, bills of material (material lists), outline and mounting dimensions, wiring details and terminating information for internal and external cabling (wire run lists), power cable charts and other data pertinent to naval electronic equipment system installations. The plans are standard F-size (28" x 40") drawings on reproducible mylar vellums. The standard plans are divided into three general types as follows:



Figure 2-1. Basic DCS HF Radio Circuit Block Diagram

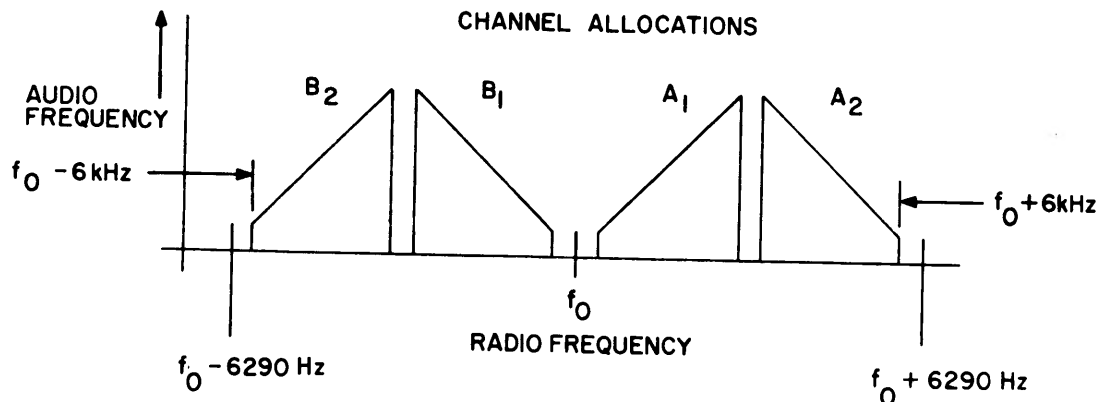


Figure 2-2. Independent Sideband Allocation

a. Circuit Functional Block Diagrams with Associated Equipment Selection Sheets. These functional block diagrams are being developed for each of the "basic types of circuits" (39 at present) used for Navy electronic equipment. The circled numbers appearing in each block on the functional block diagram refer to a specific "Equipment Selection Sheet" keyed to that block. This sheet will provide a listing of every piece of equipment that could fill the requirement for that specific block on the functional block diagram and will include the technical parameters of each equipment. It will eventually indicate the suitability classification levels of (1) planned standard, (2) preferred standard, (3) limited standard, (4) sub standard (substitute standard), (5) obsolescent and (6) obsolete.

b. Standard Blank Work Forms (Planning Aids). These forms provide a rapid means of compiling information such as jack assignments, cable designators, cable runs, equipment arrangement in standard cabinets, cable terminations, distribution frames (DF) terminations and many other types of data. The planner merely fills in the required technical information.

c. Standard Installation Drawings. These drawings contain elementary wiring diagrams of electronic equipment in common use by the Navy, plus other pertinent information such as equipment outline and mounting dimensions, distribution frame terminations, a power cable chart and a bill of material. By selecting and reproducing the diagrams of the equipment to be installed, the planning engineer will eliminate a large amount of the drafting normally required.

¹ It is planned to "key" the functional block diagrams to the CORs which means that each COR line item will call out the associated functional block diagram.

2.3.1 Use of Standard Plans

The standard plan system is designed to lead the planning engineer to each logical step in the planning process. The suggested sequence of events in using the standard plans is as follows:

- a. The COR line item will identify a functional block diagram within the standard plans program that will satisfy the requirements for the particular circuit.
- b. The functional block diagrams, in turn, will identify specific equipment selection sheets from which equipment is selected to satisfy the requirement.
- c. The equipment selection sheets, then, will identify the installation drawing numbers for the equipments selected.

The use of standard plans, to the maximum extent possible, is mandatory for planning shore electronic facilities installations. The objective is to promote standard configurations at all facilities and to reduce or eliminate redundancy in planning. Proposals to deviate from standard plans must be submitted to the Commander, Naval Electronics System Command for approval.

In certain extenuating circumstances the requirement to use standard plans may be waived. This applies primarily to a special or unique one-of-a-kind project accomplished by a private contractor. The equipment or system involved may be operational but still in a developmental state and may be supplied under an engineering furnish and install (EFI) contract that also includes engineering services and maintenance after acceptance. For example, a special purpose missile tracking radar or sonar detection system may fall in this category. Unless it is planned to procure more equipment of the same kind, it may be more cost effective to accept the contractor's in-house equipment and installation design practices (commercial practices) rather than to develop standard plans. Trade-offs or compromises may also be expedient in order to meet an emergency situation or a committed operational date to satisfy a priority mission requirement.

2.3.2 Standard Plan Availability

The Naval Electronics Systems Command, Washington Division, has been designated as the repository for the general service and security group masters of the standard plans. NAVELEX keeps these plans up to date and promulgates revised copies to the field. Standard plans for new equipments are procured with equipment by contractual provision to supply plans in accordance with UID-E-22102 or MIL-D-1000/3(EC).